

The consumer electronic devices in network 210 other than controller device 212 are referred to as target devices. The target devices in network 210 store their content (information and data) and/or broadcast services using some method or model providing a hierarchical set of data structures.

Figure 3 is a block diagram of one embodiment of target device 300 upon which embodiments of the present invention can be implemented. Although a variety of different target devices can be used in accordance with the present invention (as shown by Figure 2), an exemplary device is represented by target device 300.

In general, target device 300 comprises bus 330 for communicating information, processor 321 coupled with bus 330 for processing information and instructions, optional random access memory (RAM volatile) 322 coupled with bus 330 for storing information and instructions for processor 321, optional read-only memory (ROM non-volatile) 323 coupled with bus 330 for storing static information and instructions for processor 321, and optional data storage device 324 such as a magnetic or optical disk and disk drive coupled with bus 330 for data such as media data, objects, content and broadcast services, and bus interface 328 for interfacing with network bus 230.

AV/C devices (e.g., AV/C units) such as target device 300 that are compliant with IEEE 1394 may have up to 31 external input plugs, 31 external output plugs, 31 serial bus input plugs, 31 serial bus output plugs, 31 subunit source plugs, 31 subunit destination plugs, 31 asynchronous input plugs, and 31 asynchronous output plugs. Moreover, there can be up to 32 different types of AV/C subunits in each AV/C unit. Each type can have up to five instances.

Target device 300 has knowledge of its plugs (e.g., number and type) and of connections that are possible, as well as connections that are not possible. In accordance with the present embodiment of the present invention, this knowledge is stored in memory (e.g., ROM non-volatile 323) as state variables that can be read by other devices, in particular a controller device such as controller device 212 of Figure 2.

With reference to Figure 3, in accordance with the present invention, the plug and connection information for each target device (e.g., target device 300) is not sent to the controller device (e.g., controller device 212 of Figure 2) for processing and storage. Instead, this information is retained on target device 300 as state variables, and the state variables are interrogated by controller device 212. Accordingly, the AV/C connection process can be simplified, and a user can readily select a source device for input and an output plug to be used by the source device; refer to Figures 4A and 5, below. In addition, the controller device 212 can be simplified because it requires less processing and

memory resources. Furthermore, available bandwidth is not consumed by the transfer of connection information from target device 300 to controller device 212. Also, when a target device 300 is selected by the user, the user knows that the connection will be made, and that it will not be necessary to repeatedly try to make a connection.

Figure 4A illustrates a number of target devices (e.g., TV 430 and VCR 440) connected over network bus 230 in accordance with one embodiment of the present invention. In the present embodiment, TV 430 and VCR 440 are compliant with IEEE 1394 and incorporate the features of target device 300 of Figure 3. TV 430 comprises a monitor 431 and a tuner 432, and may also include other components (e.g., subunits) not shown. VCR 440 comprises a tuner 441, and may also include other subunits not shown. Also coupled to network bus 230 are a plurality of other target devices compliant with IEEE 1394, exemplified by 446a and 446b.

With reference to Figure 4A, TV 430 can have a multiplicity of input and output plugs; for simplicity of illustration and discussion, only a serial bus input plug 410 (digital) and video inputs/outputs V1 and V2 (analog) are shown.

Similarly, VCR 440 can have a multiplicity of input and output plugs, although only serial bus output plug 420 (digital) and video inputs/outputs V3 and V4 (analog) are shown for simplicity of illustration and discussion.